GULF RESTORATION NETWORK

UNITED FOR A HEALTHY GULF

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Re: U.S. Department of Energy Notice of Scoping for Site Selection for the Expansion of the Strategic Petroleum Reserve

The Gulf Restoration Network is a diverse coalition of local, regional, and national groups committed to uniting and empowering people to protect and restore the resources of the Gulf region. The GRN is deeply concerned about the potential environmental impacts associated with the selection of the Richton, MS site for the location of a new Strategic Petroleum Reserve site. The *Final Environmental Impact Statement for Site Selection for the Expansion of the Nation's Strategic Petroleum Reserve (2006)* fails to fully assess significant environmental, economic, and social consequences of the site selection. Accordingly, all aspects of the 2008 EIS must be revised to address the shortcomings associated with the previous EIS. There are numerous potential impacts caused by locating the reserve in Richton, MS including, but not limited to, the following issues:

A. Environmental Impacts

Water Withdrawal

The withdrawal of water from the Pascagoula River at Merrill could pose a significant risk to aquatic habitats. The DOE must consider these issues:

1) The effect of the water withdrawal on water depth, stream channel width, currents, river salinity and the saltwater wedge;
2) The effect of the water withdrawal on surrounding aquatic habitats, including wetlands that could lose a hydrologic connection with the river system due to withdrawal;
3) The impact of water withdrawal on water quality, particularly during periods of low flow;
4) The impact of reduced flow and accompanying impacts to threatened and endangered species including the yellow-blotched map turtle (a federally endangered species), gulf sturgeon (a federally threatened species), the pearl darter (a federal candidate species), the black pine snake (a federal candidate species), the gopher tortoise (a federally threatened species), and red cockaded woodpecker (a federally endangered species);
5) The cumulative impact of other water withdrawals already taking place in the Pascagoula River basin in combination with the proposed water withdrawal. For example, the Jackson County Port Authority has already guaranteed water users 100,000 mgd and Leaf River Cellulose is currently permitted to withdraw 26 mgd.

The DOE must consider the cumulative impacts of all current and planned withdrawals from the basin;

6) The impact of unpermitted water withdrawals that currently take place from the Pascagoula River, particularly during periods of low flow, including irrigation and livestock watering;
7) The impact of the water withdrawal on groundwater and drinking water;
8) The impact of the water withdrawal on salinity levels in Grand Bay National Estuarine Research Reserve and National Wildlife Reserve;
9) The impact of water withdrawal and the movement of the saltwater wedge upstream on commercial fishermen. Commercial fishermen cannot go north of the CSX bridge and may be impacted if the saltwater wedge moves further north;
10) The impact of the water withdrawal on permitted discharges to the Pascagoula River that require a existing volumes of water to dilute effluent discharges;
11) The impact of the water intake structure on fish and wildlife, including impingement and entrainment of species, particularly the yellow-blotched map turtle and pearl darters;
12) If a supplemental water source such as the Okatibee Reservoir is intended to be used during periods of low-flow, the DOE must consider how long such a release from the reservoir could be sustained given that there would likely be drought conditions throughout the basin at the same time. In addition, the Okatibee Reservoir has been at low water levels in recent years;
13) If a supplemental water source such as the Okatibee Reservoir is intended to be used during periods of low-flow, the DOE must consider how long it would take a release of water to reach lower parts of the Pascagoula River from where water is being withdrawn. The DOE must also consider how much water volume would be lost from the point of release to the withdrawal point. In addition, the DOE must consider the impact that a large release from a reservoir could have on habitat in the Pascagoula River, particularly if the temperature or quality of the water varies from that of the Pascagoula River;

Threatened and endangered species

The area of the Pascagoula River that will be the site of this activity is designated habitat for several species listed as threatened or endangered under the Endangered Species Act or that are candidates for listing. The DOE must consider these issues:

14) Impacts of all aspects of the project on the yellow-blotched map turtle (Graptemys flavimaculata, a federally endangered species), gulf sturgeon (a federally threatened species), the pearl darter (a federal candidate species), the black pine snake (a federal candidate species), the gopher tortoise (a federally threatened species), the red cockaded woodpecker (federally endangered), the American chaffseed (Schwalbea Americana, a federally endangered plant species), green sea turtle (federally endangered), loggerhead turtle (federally threatened), leatherback turtle (federally endangered), and hawksbill turtle (federally endangered);
15) The impact of an altered flow in the Pascagoula River on the yellow-blotched map turtle, pearl darter, and gulf sturgeon, including changes to habitat such as sandbar

composition, instream snag habitat, presence of invasive species, upstream headcutting, and changes in dissolved oxygen;

16) Impacts to gulf sturgeon due to impedance of migratory pathway, impedance of migratory cues (alteration of natural hydrologic flow regime or salinity along migratory path including the Pascagoula River and Mississippi Sound), reduction or alteration of deep water "summer staging areas" in the lower Pascagoula River, upstream migration of the saltwater wedge in the Pascagoula River, and alteration of natural hydrologic flow and water temperature regimes that cause a change in instream benthic macroinvertebrate fauna;
17) Impacts to pearl darters due to changes in sandbar habitat and loss of "scour holes";
18) Impacts to endangered or threatened sea turtle species due either directly or indirectly to brine discharge, pipelines, or water intake structures. Indirect impacts could include damage of seagrass beds due to pipelines or brine discharge.
19) Impacts to the Louisiana Quillwort. The *Final Environmental Impact Statement for Site Selection for the Expansion of the Nation's Strategic Petroleum Reserve (2006)* appears to understate the size and distribution of Louisiana Quillwort based upon the 1996 Recovery Plan by *Larke*. A more recent study was conducted in 2002 by GCBS, Inc under contract to USFWS;
20) Impacts to Mississippi state-listed rare plant species;
21) Impacts to the Delicate spike (*Elliptio arctata*), a Mississippi endangered species;
22) Impacts to the Pondberry (*Lindera melissifolia*), a federally endangered plant species. The pondberry is documented in the Mississippi Delta, but has recently been reported in Conecuh National Forest in Alabama. The DOE must discuss the probability of pondberry occurrence within the project area;

Brine Discharge

The DOE must fully analyze the potential impacts of, and where possible, avoid alternatives that would require disposal of brine in the Gulf of Mexico. The DOE must consider these issues:

23) The impact of brine disposal on shellfish, marine grasses, marine life larvae, small fish, plankton, and small crustaceans. In accounting for the impacts of brine disposal, the DOE must consider surface and bottom water current data, sloping bottoms, geometry of the Mississippi Sound and Gulf barrier islands, tides, local current, and seasonal velocities and variations;
24) The impact of brine disposal on essential fish habitat;
25) The impact of higher salinity due to brine discharge on diadromous fish migration, particularly, but not limited to, gulf sturgeon and Alabama shad;
26) The chemical makeup of the brine solution, including the presence of metals or other inorganic contaminants in the brine solution including, but not limited to, mercury, arsenic, manganese, lead, iron, other heavy metals, and radioactive isotopes. DOE should evaluate the total mass and concentration of such contaminants that would be discharged;
27) The potential for metals and other contaminants in the brine discharge to bioaccumulate in the Gulf ecosystem;

28) The impact of brine discharge on the area economy, specifically the commercial fishing, oystering, and shrimping industries;
29) The potential for high salinity to impact the Mississippi Sound through transport via the Pascagoula Ship Channel. The DOE must examine the potential for salt to settle into the ship channel and be transported by ship traffic;
30) The impact of the brine discharge to the recreational fishing industry and charter boats that fish south of Petit Bois Island;
31) The potential for the discharge of deoxygenated brine water (the brine solution will be deoxygenated before it is piped) to cause low oxygen or hypoxic conditions, particularly during the summer. The DOE must examine all impacts associated with low oxygen conditions on marine species and habitat;
32) The impact of pipeline burial on turbidity and sedimentation;
33) The cumulative impact of this project in conjunction with ship channel dredging in the Pascagoula Channel, dredging in the Mississippi Sound for the Gulfport Ship channel and Port of Gulfport expansion, dredging of Bayou Casotte, NPDES discharges into Bayou Casotte, discharges from ship traffic, and other sources of sediment or pollutants in the Mississippi Sound and Gulf of Mexico;

Brine and Oil Pipelines

The DOE must fully analyze the potential, and where possible avoid pipelines that would unnecessarily harm wetlands, rivers and streams, and other habitats. The DOE must consider the following issues associated with its oil and brine pipelines:

34) The cumulative environmental impact of all planned and existing pipelines including the Southeast Header Supply pipeline and Chenier Pipeline Company projects which would both have impacts in many of the same areas as planned DOE pipelines;
35) The impact of brine spills on small streams, coastal and freshwater wetlands, the Pascagoula River, Mississippi Sound, Gulf of Mexico, and other water bodies;
36) The impact of oil spills on small streams, coastal and freshwater wetlands, the Pascagoula River, Mississippi Sound, Gulf of Mexico, and other water bodies;
37) The impact of pipeline construction on aquatic resources, wildlife biodiversity, migratory birds, forest cover, and soil erosion;
38) The impact of pipelines and pumping stations on state, federal, and privately protected lands, including the Gulf Islands National Seashore, Pascagoula River Wildlife Management Area, Mississippi Sandhill Crane National Wildlife Refuge, Ward Bayou Wildlife Management Area, Nature Conservancy Deaton Tract preserve, and other preserves;
39) The impact of pipelines on sea grass beds managed by the National Park Service as part of Gulf Islands National Seashore;
40) The potential for pipelines to degrade, leak, or fail as they age;
41) The potential for a pipeline breach or leak within the Mississippi Sound;
42) The potential for brine pipelines to corrode as they age, particularly any brine pipelines being considered as "dual use" pipelines;

Other Impacts
In addition to the aforementioned impacts, the DOE must also consider:

43) All impacts to air quality both directly and indirectly resulting from the withdrawal of water, pumping of brine and oil, discharge of brine, and construction of SPR facilities and pipelines. Such impacts should include air emissions from energy facilities used to power SPR operations and construction;
44) Noise impacts associated with the operation and maintenance of pumping stations, project construction, and any other aspects of the project what could result in noise impacts;
45) The potential of hurricane impacts to affect all aspects of the project, including tank farms, storage facilities, and pipelines;
46) Impacts to designated uses of the Pascagoula River and all other water bodies under the Clean Water Act that could be impacted by the project;
47) The cumulative impact of all other major projects, including federally permitted projects, such as two liquefied natural gas (LNG) facilities, Chevron Pascagoula Refinery expansion, and Pascagoula Ship Channel dredging;
48) The potential for fire or explosion of any SPR facilities, tank farms, or pipelines located near the Chevron Pascagoula Refinery, which has had a recent history of fires and explosions at the refinery;
49) The potential secondary and indirect impacts caused by the project, including increased oil and gas infrastructure development in the region, road construction or widening, ship channel construction or widening, and housing and other facilities for temporary or permanent workers;
50) The cumulative impact of emissions from the SPR project construction and the use of oil stored in the salt dome, along with other human actions, in causing or contributing to climate change;
51) The cumulative impact of the wetland loss and waterbottom loss associated with the SPR expansion project in the context of wetland and habitat loss associated with climate change-induced sea level rise;
52) The impact of climate change-induced sea level rise on the construction, operation, and long-term viability of this project;
53) The impact of altered hydrologic cycles due to climate change on water flows of the Pascagoula River Basin in association with the water withdrawal and brine discharge of this project;
54) The possibility of stronger and more frequent tropical cyclone activity due to climate change and potential impacts to this project;
55) The spread of invasive or exotic species in conjunction with climate change and the alterations to habitat that would occur due to this project including, but not limited to water withdrawal, brine disposal, brine or oil spillage, construction of pumping stations, tank farms, transmission lines, pipelines, and other facilities;
56) Impacts to aquatic and terrestrial resources, as well as cultural resources, at the location of the salt storage domes. DOE must identify the location, including exact longitude and latitude coordinates, of where the salt domes would be located;
57) Impacts to migratory birds and raptors caused by the construction of the large storage tanks, the electrical transmission lines, and any other tall structures proposed for the SPR facilities and work associated with the pipeline installation activities. To ascertain potential effects, the

DOE should identify locations and heights of storage tanks, transmission lines, and all tall structures proposed for the project sites;

The Pascagoula River as a Wild and Scenic River

The DOE must evaluate:

58) The suitability of the Pascagoula River for designation as a Scenic and Wild River under the National Wild and Scenic Rivers Act;
59) Impacts to the status of the Pascagoula River as a Mississippi Scenic Stream.

B. *ALTERNATIVES*

We request that the DOE examine the following alternatives:

1) A No Build Alternative;
2) Alternate salt dome locations;
3) Alternatives that result in the use of the salt that is mined from the dome for an alternative purpose such as use by industry or salt producers;
4) Alternative that result in no discharge of brine to the Gulf of Mexico. Such alternatives could include, but are not limited to, desalination plants, desalination ponds, and deep well injection.
5) Alternative water withdrawal sites that do not rely upon large flows of fresh water from the Pascagoula River. Such alternatives could include, but are not limited to, water withdrawal from the Mississippi River or the Gulf of Mexico. According to the U.S.G.S., the average annual flow rate of the Mississippi River near Liberty is approximately 600 times the average annual flow rate of the Pascagoula River at Merrill. The impact to the project cost would be negligible from adding a net 20 miles of pipeline. Installing a second pipeline in the same right away would result in a minimal percentage increase in the overall program cost;
6) Alternative locations of SPR tank farms that minimize wetland impacts and are less vulnerable to hurricanes, fires at the Chevron refinery, or terrorist or other types of attack or accidents. For example, a tank farm could be located further inland, along the planned pipeline route;
7) Alternatives that include the burial of electric transmission lines in order to avoid bird strikes;
8) Alternative pipeline configurations and right-of-ways that minimize wetland impacts, impacts to conservation lands, and the potential for both oil and brine pipeline spills to impact aquatic resources. Such alternatives should include, but not be limited to, alternatives that follow already existing right-of-ways or established roads. Every effort should be made to avoid state, federal, and privately conserved lands.

C. Issues DOE must study/Address

1) Instream Flow

Any plan to withdraw fresh water from the Pascagoula River must examine the current instream flow of the Pascagoula River and determine what level of withdrawal the Pascagoula River could support, given the existing and planned future withdrawals and that there has been little research done to assess water flows necessary to maintain habitat for endangered species and other wildlife that rely upon the Pascagoula River.

It is our position that the DOE must fund a study using Instream Flow Incremental Methodology (IFIM), or some similar methodology. The DOE cannot to argue that a withdrawal of 50 mgd from the Pascagoula would not harm the species and habitat of the River without studying the instream flow and all other water withdrawals currently taking place and planned. In addition, the DOE must define what would happen during low-flow or drought conditions and define at what point a withdrawal would be restricted. IFIM was developed by an interdisciplinary team approach and was founded on a basic understanding that water supply and habitats of streams must be managed in concert (See attachments describing IFIM). We believe IFIM offers the best approach to answer these questions.

2) *Brine Discharge Modeling*

We believe the brine discharge modeling conducted by DOE in the Final *Environmental Impact Statement for Site Selection for the Expansion of the Nation's Strategic Petroleum Reserve (2006)* failed to adequately account for the complex currents, sloping bottoms, geometry of the Mississippi sound, tides, and local currents. As a result, we do not believe that the modeling done by DOE can be relied upon to accurately predict the impacts of the brine discharge. The DOE should conduct new modeling of the brine discharge using a 3-dimensional model that looks at changes over time and accounts for changing currents. In addition to salinity, the DOE must also model dissolved oxygen impacts associated with the brine discharge.

3) Wetland Mitigation

In the *Environmental Impact Statement for Site Selection for the Expansion of the Nation's Strategic Petroleum Reserve (2006)*, the DOE failed to identify how it would mitigate for wetland losses from the project, saying that wetland mitigation would be determined through the Army Corps of Engineers 404 permitting process. The DOE also failed to explain how it would mitigate for any brine or oil spills that impacted wetlands or water bodies. The issue of wetland mitigation is no minor issue. It remains unclear whether there is any mitigation bank in Mississippi that could sell enough credits for impacts to 1,600 acres of wetlands and the type of credits necessary to mitigate for this project. In addition, mitigation should be done within the Pascagoula River watershed. Ironically, the proposed project will actually impact an already existing mitigation bank if the water withdrawal occurs near Merill, MS. We believe that the issue of mitigation must be addressed, as the wetland impacts of the proposed project are significant and should be addressed in an EIS.

4) Salt Dome Properties

We believe that DOE needs to perform a 3-D seismic study of the salt dome to identify any salt faults or anomalies that exist in the dome. These faults or anomalies must be considered in determining whether the Richton site is an appropriate location for the storage of oil.

Incorporation of Comments

The GRN notes that comments are being submitted by persons having expertise on issues of specific concern to the GRN. We therefore adopt as our comments and incorporate herein by reference any and all comments submitted by the Gulf of Mexico Regional Fishery Management Council, the Gulf States Marine Fish Commission, NOAA's National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service, the U. S. Environmental Protection Agency, the National Park Service, and the Mississippi Department of Wildlife, Fisheries & Parks.

Sincerely,

Jeff Grimes
Assistant Director, Water Resources

Cc: Congressman Gene Taylor
Senator Thad Cochran
Senator Roger Wicker
MS Dept. of Marine Resources
NOAA Fisheries Service
U.S. Fish and Wildlife Service
U.S. EPA

Historical Backdrop to IFIM

Where did IFIM come from?

Instream flow methods have been developed by biologists and hydrologists working for agencies having regulatory responsibility related to water development. Such efforts since the late 1960's have provided the impetus for ecological studies leading to a growth in the understanding of the relations between stream flow and aquatic habitats. Most of the evidence gathered to date has focused on fish and macro-invertebrate habitat requirements, with recent emphasis on the relation between stream flow and woody riparian vegetation and recreation. Water management problem solving has matured from setting fixed **minimum flows** with no linkage to a specific aquatic habitat benefit to **incremental methods** in which aquatic habitats are quantified as a function of discharge.

Minimum Flow Standards Provide Minimal Protection

Following the reservoir and water development era of the mid-twentieth century, resource agencies became concerned over the loss of fisheries in the west. Consequently, several states began issuing rules for protecting existing stream resources from future depletions. Many assessment methods appeared during the 60's and early 70's based on hydrologic analysis of the water supply coupled with empirical observations of habitat quality and an understanding of riverine fish ecology. These efforts led to a class of instream flow techniques meant to help reserve water within the channel for the benefit of fish and other aquatic life. Application of these methods usually resulted in a single 'minimum' flow value for a stream reach, below which water may not be withdrawn for consumptive use. The minimum flow is almost always less than the optimal habitat condition. These 'reservations' of water form the basis for issuing water permits in many states.

Impact Analysis Leads to Increased Resource Protection

Following enactment of the National Environmental Policy Act (NEPA) in 1970, attention shifted from minimum flows to evaluation of federally funded water projects. Methods capable of quantifying the effect of incremental changes in streamflow to evaluate alternative development schemes were needed. This led to the development of habitat versus discharge functions developed from life-stage-specific relations for selected species, that is, fish passage, spawning, and rearing habitat versus flow.

Research took the form of analyses correlating the well-being of fish populations with physical and chemical attributes of the flow regime. A set of these variables was shown to contribute significantly to the variation in fish production. These were

- water velocity
- minimal water depths
- instream objects such as cover

interests get involved in decisions regarding water stored during high-flow periods and its release when the most critical conditions occur downstream. Sharing the storage allows for delivery to relieve critical conditions.

Development of IFIM

IFIM unfolded against the backdrop of minimum flow standards, quantitative impact analyses, water budgets, and interdisciplinary analyses. IFIM was developed by an interdisciplinary team approach and was founded on a basic understanding and description of the water supply and habitats within stream reaches of concern. Historical analysis of the flow regime using a monthly, weekly, or other appropriate timestep to describe the **baseline** hydrologic conditions was considered essential because this type of analysis was normal practice within the water resource profession. Looking at streamflow through time allows one to compare the frequency and duration of wet and dry periods, to examine the difference between snow-melt and rain-driven systems, and to determine the intensity and duration of short-term events such as cloud bursts and peaking cycles. To influence operating decisions within large-scale water development settings, a tool was needed that illuminated conflicts and complementary water uses, considered and evaluated each user's needs, and was understandable, acceptable, and easy to use by a broad clientele. Such decision arenas involve a diversity of disciplines, including engineers, hydrologists, biologists, recreation planners, lawyers, and political scientists.

This interdisciplinary effort led to the conclusion that an analytical methodology should handle a variety of instream flow problems, from simple diversions to complex storage and release schemes involving hydropeaking schedules, and a network of interconnected reservoirs. For such a methodology to be suitable for evaluating alternatives, it had to be useful in identifying, evaluating, and comparing potential solutions, be capable of being tailored to a specific stream reach, and be expandable such that reach information could be applied throughout a river basin. With this general charter, IFIM was developed over a period of 15 years into a river network and decision arena analysis that incorporates fish habitat, recreational opportunity, and woody vegetation response to alternative water management schemes. Information is presented as a time series of flow and habitat at selected points within a river system for various existing and proposed water system operation alternatives.